

NON-PUBLIC?: N
ACCESSION #: 8809090096
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Braidwood, Unit 2 PAGE: 1 of 3

DOCKET NUMBER: 05000457

TITLE: Unit 2 Reactor Trip Due to Low Water Level Caused by Erratic
Operation of Main Water Regulating Valve
EVENT DATE: 06/22/88 LER #: 88-014-01 REPORT DATE: 08/24/88

OPERATING MODE: 1 POWER LEVEL: 025

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Daniel Stroh, Technical Staff Engineer
TELEPHONE #: 815-458-2801 Ext. 2477

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: At 0029 on June 22, 1988, a reactor trip occurred as the result of a LO-LO level on steam generator (S/G) 2B. During the transfer of the feedwater system from the Feedwater Regulating Bypass Valves (FWRBPV) to the Main Feedwater Regulating Valves (MFWRV), the MFWRV inadvertently opened to approximately 15%. The MFWRV did not respond to a closure signal and S/G water level increased to the HI-HI level set point. This resulted in a turbine trip, feedwater isolation, and a feedwater pump trip. S/G level rapidly fell, and 18 seconds later S/G 2D reached the LO-LO level setpoint resulting in a reactor trip and automatic start of both auxiliary feedwater pumps as designed. The cause of this event was low static spring preload, dirt and grease partially blocking the volume booster, and dynamic system tuning was identified as needed to provide proper feedwater regulating valve action in response to valve demand. Immediate corrective action was to restore S/G water level to normal. The Feedwater Regulating Valve was repaired prior to being returned to service. There have been no previous occurrences as a result of erratic Feedwater Regulating Valve Operations.

(End of Abstract)

TEXT: PAGE: 2 of 3

Energy Industry Identification System (EIIS) codes are identified in the text

as (xx)

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: Braidwood Unit 2; Event Date: June 22, 1988; Event Time: 0029
MODE: 1 - Power Operation; Rx Power: 25%;
RCS (AB) Temperature/Pressure: 554.7 Degrees F/2235 psig

B. DESCRIPTION OF EVENT:

There were no systems or components inoperable at the beginning of the event that contributed to the severity of the event.

At 0029 on June 22, 1988, a reactor trip occurred as the result of a Lo-Lo level on steam generator (S/G) 2D.

Prior to the event, preparations were being made to realign the feedwater (FW)(JB) flowpath from the feedwater regulating bypass valves (FWRBPV) to the main feedwater regulating valves (MFWRV). This was being done to support increasing reactor power. Per procedure, both the MFWRV's and the FWRBPV's are to be put in manual. The MFWRV are then to be opened to about 2%. The FWRBPV is then closed 3-4% and the system is allowed to stabilize. This sequence is repeated until the FWRBPV is fully closed and the MFWRV can be put in automatic control.

This sequence was successfully completed on the 2A S/G loop and valve transfer was accomplished without incident.

The 2B S/G loop was the next to be transferred from the FWRBPV to the MFWRV's. An open demand signal of about 2% was given to the MFWRV. The demand on the FWRBPV was lowered by a small amount until S/G level stabilized. This evolution was continued until, unknown to the NSO, the MFWRV inadvertently opened about 15%. The NSO quickly recognized an increasing S/G water level and lowered demand on the FWRBPV, and started to lower demand on the MFWRV. However, the MFWRV did not respond, and S/G water level increased rapidly, until the FWRBPV was completely closed. The water level in the 2B S/G soon reached the Hi-Hi level set point of 78.1%.

This resulted in a main turbine trip, a feedwater isolation, and a feedwater pump trip. This stopped all feedwater to the S/G's and closed the steam valves to the main turbine. With no steam flow, the S/G's saw a rapid shrink in volume, and 18 seconds after the Hi-Hi trip, S/G 2D caused a reactor trip on Lo-Lo level at 17%. The lo-lo level also generated an automatic start of both auxiliary feedwater pumps (AF) (BA)

as designed. Control rods were inserted and a negative rate trip signal followed on all four power range channels. With the reactor trip and low temperature average (T-ave), another feedwater isolation signal was generated. All plant systems functioned as designed.

Stable plant conditions and normal S/G levels were reestablished at 0122. At 0130 the AF pumps were secured and the S/G's were again supplied by the feedwater system.

The appropriate NRC notification via the ENS phone system was made at 0311 on June 22, 1988 pursuant to 10CFR50.72(b)(2)(ii).

This event is being reported pursuant to 10CFR50.73(a)(2)(iv) - Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature, including the Reactor Protection System.

TEXT: PAGE: 3 of 3

C. CAUSE OF EVENT:

The root cause of this event was the erratic operation of the loop 2B MFWRV 2FW520, resulting in an uncontrolled opening of the valve. Several items were found deficient when investigating the operation of the MFWRV. Static spring preload was found low on the valve operator. The volume booster used on the actuator was found to be partially blocked with dirt and grease, and dynamic system tuning was identified as needed to provide proper valve action in response to valve demand.

D. SAFETY ANALYSIS:

There were no safety consequences as a result of this event. The turbine trip, the feedwater system isolation, the feedwater turbine trip, the reactor trip, and the auxiliary feedwater actuation all operated as designed. Had this event occurred under worst case conditions, operating at 100% power, the results would have been the same.

E. CORRECTIVE ACTIONS:

Immediate corrective action was to restore the S/G water levels to their normal operating band using the AF system. Nuclear Work Request (NWR) 23785 was written to troubleshoot and repair feedwater regulating valve 2FW520. The repairs were completed prior to returning the valve to service on June 22, 1988.

F. PREVIOUS OCCURRENCES:

There have been no previous occurrences as a result of erratic feedwater regulating valve operations.

G. COMPONENT FAILURE DATA:

1) MANUFACTURER NOMENCLATURE MODEL NUMBER MFG PART NUMBER

Fisher Feedwater Control SS-137-ENA 16FA37RG
Valve

2) A search of the NPRDS Data Base revealed no similar occurrences.

ATTACHMENT # 1 TO ANO # 8809090096 PAGE: 1 of 1

Commonwealth Edison
Braidwood Nuclear Power Station
Route #1, Box 84
Braceville, Illinois 60407
Telephone 815/458-2801

BW/88-992

August 24, 1988

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Dear Sir:

The enclosed Licensee Event Report from Braidwood Generating Station is being transmitted to you as a Supplemental Report to LER 88-014-00.

This report is number 88-014-01; Docket No. 50-457.

Very truly yours,
/s/ R. E. Querio
R. E. Querio
Station Manager
Braidwood Nuclear Station

REQ/PGH/cmg
(7126z)

Enclosure: Licensee Event Report No. 88-014-01
cc: NRC Region III Administrator

NRC Resident Inspector
INPO Record Center
CECo Distribution List

ATTACHMENT # 2 TO ANO # 8809090096 PAGE: 1 of 1

DwAP 1250-2T4
Revision 0

SUPPLEMENT TO DVR
APPROVED
DVR NO. JUL 23 1986
STA UNIT YEAR NO. BRAIDWOOD
D - 20 - 2 - 88 - 106 ON-SITE REVIEW

PART 1 TITLE OF EVENT OCCURRED
Unit 2 Reactor Trip due to Low
Water Level caused by Erratic
Operation of Main Regulating Valve 06/22/88 0029
DATE TIME

REASON FOR SUPPLEMENTAL REPORT

This supplemental report is being issued to revise the LER Sequential Number on the Licensee Event Report Text Continuation Form which was previously sent out incorrectly.

PART 2

ACCEPTANCE BY STATION REVIEW /s/ 8/24/88 /s/

DATE 8/29/88

SUPPLEMENTAL REPORT APPROVED
AND AUTHORIZED FOR
DISTRIBUTION /s/ R. E. Querio 9/1/88
STATION MANAGER Date

*** END OF DOCUMENT ***
